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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,844	05/04/2007	Thomas Schmidt	12834-00021-US	2786
23416 7590 12/02/2010 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899				
EXAMINER				
ARCIERO, ADAM A				
ART UNIT		PAPER NUMBER		
1727				
MAIL DATE		DELIVERY MODE		
12/02/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,844

Applicant(s)

SCHMIDT ET AL.

Examiner

ADAM A. ARCIERO

Art Unit

1727

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date 08/18/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

**HIGH-PERFORMANCE MEMBRANE ELECTRODE UNIT AND THE USE THEREOF
IN FUEL CELLS**

Examiner: Adam Arciero S.N. 10/589,844 Art Unit: 1727 November 30, 2010

DETAILED ACTION

1. This Office action is in response to the application filed on November 15, 2006. Claims 1-34 are currently pending in the present application, and said claims have been fully considered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 3-24 and 28-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Bjerrum et al. (WO 01/18894 A2, found in IDS).

As to Claims 1 and 31, Bjerrum et al. discloses a membrane electrode assembly comprising an acid-doped solid electrolyte including at least one polymer with at least one nitrogen atom (polybenzimidazole) (pg. 9, line 15 to pg. 10, line 5) and at least one mineral acid (phosphoric acid) (pg. 13, lines 19-30).

As to Claims 3-5, Bjerrum et al. discloses wherein the membrane comprises an alkaline polymer containing at least one aromatic ring with at least one nitrogen atom, such as polybenzimidazole (pg. 9, line 15 to pg. 10, line 5).

As to Claim 6, Bjerrum et al. discloses wherein the membrane comprises a polymer blend of more than one polymer (pg. 9, line 15 to pg. 10, line 13).

As to Claims 7 and 34, Bjerrum et al. discloses wherein the at least one mineral acid is phosphoric acid (pg. 13, lines 19-30).

As to Claim 8, Bjerrum et al. discloses wherein said membrane comprises para-polybenzimidazoles (pg. 9, lines 29-35).

As to Claims 9-22 and 32, it is noted that claims 9-22 and 32 are product-by-process claims. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since Bjerrum et al.'s membrane is the same to that of the Applicant's, Applicant's process is not given patentable weight in this claim.

As to Claim 23, Bjerrum et al. discloses wherein at least one electrode comprises a catalyst comprising a composite of platinum with chromium, titanium or tungsten (pg. 16, lines 20-26).

As to Claim 24, Bjerrum et al. discloses wherein the catalyst is applied to the membrane (pg. 16, lines 20-22).

As to Claims 28 and 33, Bjerrum et al. discloses wherein the catalyst loading of the membrane electrode unit is 0.1 mg/cm^2 to 1.0 mg/cm^2 (pg. 17, lines 4-17).

As to Claim 29, Bjerrum et al. discloses wherein the catalyst particles include carbon as a support ((pg. 17, lines 4-17).

As to Claim 30, Bjerrum et al. discloses wherein the weight ratio of catalyst particles is in a range of 1:100 or 100:1 (pg. 16, lines 20-22).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 2 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjerrum et al. (WO 01/18894 A2, found in IDS) in view of Kiefer et al. (US 2005/0084727 A1).

As to Claim 2, Bjerrum et al. does not specifically disclose wherein a polyphosphazene is employed as the polymer with at least one nitrogen atom.

However, Kiefer et al. teaches of a PEM comprising a polymer with a nitrogen atom such as a polyphosphazene polymer or a polyazole (polybenzimidazole) (paragraph [0041]). Kiefer is identifying the two polymers as functional equivalents for use in membranes of fuel cells. The courts have found that since both Bjerrum et al. and Kiefer et al. both teach a suitable polymer for a membrane in a fuel cell, it would have been *prima facie* obvious to substitute one material for the other. Express suggestion to substitute one equivalent for another need not be present to render such substitution obvious. See MPEP 2144, KSR.

As to Claim 25, Bjerrum et al. does not specifically disclose wherein the catalyst layer has a thickness of 0.1 to 50 microns.

However, Kiefer et al. teaches of a catalyst layer with a preferable thickness in the range of 1 to 1,000 microns. This overlaps the claimed ranges. The courts have held that when “a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003).

As to Claims 26-27, Bjerrum et al. does not specifically disclose the particle sizes of the catalyst.

However, Kiefer et al. teaches of catalyst particles with a preferable size of 1 to 1,000 nm

(paragraph [0166]). This overlaps the claimed ranges. The courts have held that when “a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 7am to 4pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Adam A. Arciero/

Examiner, Art Unit 1727

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1727